

CLAIMS

Claim 1. A method of bending a metal sheet (10) that has upstanding sides (11, 13), the steps of said method comprising:

rolling each said upstanding side (11, 13) gradually thinner towards one end of said upstanding side to cause said sheet to bend away from the thinned ends.

Claim 2. The method according to Claim 1, wherein the step of rolling said upstanding sides (11, 13) includes the step of rolling each of said upstanding sides (11, 13) between two rollers (15, 16; 17, 18), and varying the angle between the two axes of the rollers while rolling the upstanding sides to vary the bending radius of the sheet.

Claim 3. The method according to Claim 1, wherein the step of rolling said upstanding sides (11, 13) includes the step of rolling each of said upstanding sides (11, 13) between two rollers (15, 16; 17, 18), and varying the rolling pressure of the rollers while rolling the upstanding sides to vary the bending radius of the sheet.

Claim 4. The method according to Claim 1, wherein the step of rolling said upstanding sides (11, 13) includes the step of rolling each of said upstanding sides (11, 13) between two rollers (15, 16; 17, 18), and varying both the angle between the

two axes of the rollers and the rolling pressure of the rollers while rolling the upstanding sides to vary the bending radius of the sheet.

Claim 5. The method according to Claim 2, wherein the step of varying the angle between the two axes of the rollers includes the step of varying the angle between the two axes of the rollers following a predetermined schedule.

Claim 6. The method according to Claim 3, wherein the step of varying the rolling pressure of the rollers includes the step of varying the rolling pressure of the rollers following a predetermined schedule.

Claim 7. The method according to Claim 4, wherein the steps of varying the angle between the axes of the two rollers and varying the rolling pressure of the rollers include the steps of varying the angle between the two axes of the rollers and varying the rolling pressure of the rollers following a predetermined schedule.

Claim 8. The method according to Claim 1, wherein the ends of said upstanding sides (11, 13) are formed into beads (12, 14), said method including the step of rolling said upstanding sides gradually thinner towards said beads without thinning said beads.

Claim 9. The method according to Claim 8, wherein said sheet is a roofing sheet, said method including the step of rolling the sides of said roofing sheet gradually thinner towards said beads without thinning the beads.

Claim 10. A bending apparatus for bending a metal sheet with upstanding sides (11, 13), said apparatus comprising, for each said upstanding side: a rolling device (19, 20) with a pair of rollers (15, 16; 17, 18) for rolling said upstanding side between said pair of rollers; a device (42) for adjusting the rolling force of said pair of rollers; and a device (40, 41) for adjusting the angle between the axes of said pair of rollers.

Claim 11. The bending apparatus according to Claim 10, wherein said rolling devices (19, 20) are movably carried by a frame (30) so as to be movable towards and away from each other along guides (31 - 34) for adjusting the width of the sheet.

Claim 12. The bending apparatus according to Claim 11, wherein the rolling devices (19, 20) are freely movable sideways and are guided sideways by the upstanding sides of the sheet for adaptation to the width of the sheet.

Claim 13. The bending apparatus according to Claim 10, wherein the devices for adjusting the angle between the axes of the rollers and for adjusting the rolling force of the rollers comprise ball screws (41, 42) controlled by motors.

Claim 14. The bending apparatus according to Claim 11, wherein the devices for adjusting the angle between the axes of the rollers and for adjusting the rolling force of the rollers comprise ball screws (41, 42) controlled by motors.

Claim 15. The bending apparatus according to Claim 12, wherein the devices for adjusting the angle between the axes of the rollers and for adjusting the rolling force of the rollers comprise ball screws (41, 42) controlled by motors.

Claim 16. The bending apparatus according to Claim 10, further including ball screws (36) for displacing the rolling devices (19, 20) along guides (31 - 34).

Claim 17. The bending device according to Claim 11, further including ball screws (36) for displacing the rolling devices (19, 20) along said guides (31 - 34).

Claim 18. The bending device according to Claim 12, further including ball screws (36) for displacing the rolling devices (19, 20) along said guides (31 - 34).

Claim 19. The bending device according to Claim 13, further including ball screws (36) for displacing the rolling devices (19, 20) along guides (31 - 34).

Claim 20. A method of bending a profile of metal sheet, said method comprising the step of rolling a part of the profile thinner to cause the profile to bend away from the thinned part thereof.